

CLAIMS

1. An apparatus for use in conducting chemical or biological reactions requiring the input of at least one fluid reagent and/or the output of at least one fluid product, the apparatus comprising a reaction chamber having an inlet for the supply of at least one reactant and an outlet for the recovery of at least one product, the reaction chamber being provided with a regulator comprising a propeller mounted in the reaction chamber in the region of the inlet for dispersing the at least one reactant in the reaction chamber.

2. An apparatus as claimed in claim 1, wherein the regulator is provided with a perforated element capable of allowing the passage of fluid material therethrough.

3. An apparatus as claimed in claim 2, wherein the perforated element is operable between a first closed position arranged to allow passage of the fluid through the perforations, and a second open position arranged to allow the passage of the fluid by passing the perforations.

4. An apparatus as claimed in either claim 2 or 3, wherein the perforated element is disposed upstream of the propeller.

5. An apparatus as claimed in any of claims 2 or 3, wherein the perforated element is disposed downstream of the propeller.

6. An apparatus as claimed in any one of claims 2 to 5, wherein the perforated element is rotatable.

7. An apparatus as claimed in any one of claims 2 to 6, wherein the perforated element is aligned perpendicular to the longitudinal axis of the inlet or outlet.

8. An apparatus as claimed in any of claims 2 to 7, wherein the perforated element is disposed at an angle to the inlet or outlet wall in the range of  $1^{\circ}$  to  $25^{\circ}$ .

9. An apparatus as claimed in any preceding claim, wherein the perforated element and/or propeller is heated by a heating means.

10. An apparatus as claimed in claim 9, wherein the means for heating is connected directly to the perforated element or propeller.

11. An apparatus as claimed in claim 9 or claim 10, wherein the means for heating comprises an electrical power supply and/or thermal conduction.

12. An apparatus as claimed in any preceding claim, wherein the regulator is heated by means of a heating coil disposed externally or internally of the inlet or outlet.

13. An apparatus as claimed in any preceding claim, wherein the propeller is connected to a power supply for driving the propeller.

14. An apparatus as claimed in any preceding claim, wherein the propeller comprises a plurality of veins in the shape of substantially a semi-circle, a tear drop, a half tear drop, a bellcurve, a half bellcurve, a rectangle, a triangle and derivatives thereof.

15. An apparatus as claimed in any preceding claim, wherein the heat and/or speed of the propeller and/or perforated element is controlled by an electronic control unit.

16. An apparatus as claimed in claim 15, wherein the electronic control unit is capable of receiving data from sensors disposed at one or more positions in the apparatus.

17. An apparatus as claimed in any preceding claim, wherein the propeller is a composite of a heat conductive material and a non-heat conductive material.

18. An apparatus as claimed in any preceding claim, wherein the axis of the propeller is substantially in alignment with a longitudinal axis of the inlet or outlet.

19. An apparatus as claimed in any preceding claim, wherein the axis of the propeller is between  $0.5^{\circ}$  to  $60^{\circ}$  with respect of a longitudinal axis of the inlet or outlet.

20. An apparatus as claimed in any preceding claim, wherein the perforated element comprises a gauze.

21. An apparatus as claimed in any preceding claim, wherein the fluid reagent comprises two reagents which quickly disassociate from one another.

22. An apparatus as claimed in any of claims 1 to 18, wherein the fluid reagent comprises at least one reagent which reverts to a solid or liquid state quickly.

23. An apparatus as claimed in any of claims 1 to 18, wherein the reagent is converted to a substantially gaseous state by atomization or vaporization.

24. An apparatus as claimed in any preceding claim, wherein the substantially fluid product comprises exhaust gases from the reaction.

25. An apparatus as claimed in claim 24, wherein the fluid product is mixed with waste products and requires further processing.

26. An apparatus as claimed in any preceding claim, wherein the regulator further comprises a portion which is charged so as to attract and collect particulate matter from gaseous products.

27. An apparatus as claimed in any preceding claim, wherein the regulator further comprises a filter to collect particulate matter from gaseous products.

28. An apparatus as claimed in claim 27, wherein a suction means is attached to the filter.

29. An apparatus as claimed in any preceding claim, wherein the regulator further comprises a portion for liquefying gaseous material from the gaseous product.

30. An apparatus as claimed in claim 29, wherein a suction means is attached to the portion for liquefying gaseous material.

31. An apparatus with a regulator substantially as herein described with reference to and as illustrated in the accompanying Figures.